Remarks:

Claims 41-49, 51-64, 66-82, and 84-95 remain for consideration in this application, with claims 41, 53, 71, 89-95 being in independent format.

As an initial matter, Applicants note with appreciation that claim 89 was indicated as being allowable in the Office Action. Claims 91-95 were listed on the Office Action Summary sheet as being pending in this application, however, these claims were not labeled as being either allowable or rejected, and were not substantively addressed in the Office Action itself. Applicants note that claims 91 and 94 should be allowable for the same reasons as claim 89, as these claims also recite the presence of a weak acid and a strong acid in the composition. Claims 92-93 and 95 should be allowable for the same reasons explained in detail below with regard to claims 41, 53, 71, and 90. Applicants respectfully request clarification of the status of these claims in the next Office Action.

Claims 41, 53, 71, 90, 92, 93, and 95 have been amended to recite that the composition comprises an acid. Support for this limitation can be found in the specification on page 6, lines 22-31 and page 7, lines 1-18.

Claims 41, 53, 71, 92, 93, and 95 have also been amended to specify that the inventive composition is "non-photoimageable." The term photoimageable is well-known in the art as referring to compositions where exposure to light chemically alters the composition's solubility in certain solvents (e.g., photoresist developers). In contrast, the solubility of non-photoimageable compositions is not changed upon exposure to light. Support for this limitation can be found throughout the specification, for example on page 8, lines 9-25; page 9, lines 29-31; Figs. 3 and 4; and on page 23, lines 20-31. In particular, Figs. 3 and 4 depict stacks processed using the inventive

middle layers. After light exposure, the photoresist layer of the processed stacks has been imaged (patterned), while the middle layer (i.e., the inventive layer) of the processed stacks has not. Further support that the composition is non-photoimageable is that the cured composition is substantially insoluble in typical photoresist solvents, such as ethyl lactate. The results of the stripping tests performed throughout the examples, confirm that the middle layers are substantially insoluble in photoresist developer. If the composition was photoimageable, it would be soluble in the developer and have a much higher percent stripping. Thus, a person of ordinary skill in the art would readily appreciate, based upon the teachings of the instant disclosure, that the claimed composition is not photoimageable.

Turning to the Office Action, claims 41, 48, 49, 53, 57, 63, 64, 71, 75, 81, and 82 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 7,041,748 to Lin et al. (hereinafter "Lin"). Claims 52, 67, and 85 were rejected under 35 U.S.C. § 102(e) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being obvious over Lin. And claims 54-66, 68-70, 72-74, 86-88, and 90 were rejected under 35 U.S.C. § 103(a) as being obvious over Lin. Applicants submit that independent claims 41, 53, 71, and 90 are neither anticipated by, nor obvious over Lin for at least the following reasons.

First, there is no teaching or suggestion in Lin of a composition comprising "an acid and a constituent dissolved or dispersed in a solvent system" as recited in independent claims 41, 53, 71, and 90. Rather, Lin discloses a patternable composition comprising a polymer component, a photosensitive *acid generator*, a crosslinking agent, and a solvent. Col. 21, lines 47-56. The composition is applied to a substrate and "heated to an elevated temperature . . . *to drive off solvent*."

Col. 22, lines 21-25 (emphasis added). The dry composition is then exposed to radiation to form the image. Col. 22, lines 30-34. As explained in Column 3, lines 10-25 of Lin, acid is generated by the photoacid generator in the composition when exposed to radiation, which then causes the acid-sensitive composition to either become soluble or insoluble in the exposed areas (depending upon whether it is a positive- or negative-tone composition). In Lin, by the time any acid is present in the composition, the solvent is already gone. Thus, Lin cannot be said to teach or suggest a composition comprising "an acid and a constituent dissolved or dispersed in a solvent system." Accordingly, independent claims 41, 53, 71, and 90 are not anticipated by Lin, and the rejection must be withdrawn.

These claims are also not obvious in view of Lin, as a person skilled in the art would have no "apparent reason" to modify Lin to include acid in the composition. *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41 (2007). That is, Lin purposefully excludes acid from the composition because the composition itself is acid-sensitive. Including acid in the composition would render the composition of Lin unsuitable for its intended purpose, and there would be no reasonable expectation of success in making such modification. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). That is, Lin relies on the mechanism of the photosensitive acid generator to generate an acid during imagewise exposure of the composition to create the pattern in the composition. Without a photosensitive acid *generator*, no pattern would form. Thus, a person of ordinary skill in the art reading Lin, would be discouraged from the path taken by Applicants, because putting acid in the starting composition of Lin with the solvent is fundamentally incompatible with the teachings of this reference and results in a "seemingly inoperable device." *In re Gurley*, 27 F3d 551, 553 (Fed. Cir.

1994) citing *In re Sponnoble*, 405 F.2d 578, 587 (C.C.P.A. 1969). Accordingly, including an acid in the composition would not be obvious, and the rejection must be withdrawn.

Second, there is no teaching or suggestion in Lin of a composition that is "non-photoimageable," as recited in independent claims 41, 53, 71, and 90. Rather, Lin is specifically directed towards imageable compositions, and a person skilled in the art would have no apparent reason to modify the composition of Lin to make it non-photoimageable, as claimed. The entire purpose of Lin is to provide compositions that "combine the functions of a photoresist and a traditional low-k dielectric material into a single material[, so that] patterning ... can be accomplished on the dielectric itself. No separate photoresist ... [is] needed." Col. 4, lines 32-37. In fact, Lin specifically teaches away from the claimed methods and compositions. In particular, Lin teaches that methods that include first patterning the photoresist, followed by various etching steps to transfer the pattern into each subsequent layer are "extremely insufficient" for a number of reasons (col. 2, lines 21-33). Rather, the intended purpose of the disclosed composition of Lin is to provide a low-k dielectric material that can be patterned *without* the use of "masking layers, photoresist[s], and [anti-reflective coatings]," or numerous "processing steps for patterning the same." Col. 2, lines 48-50. Accordingly, a person skilled in the art would not be motivated to modify Lin to yield a non-photoimageable composition, because Lin teaches away from this modification, and it would render the composition of Lin unsuitable for its intended purpose. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). Thus, Applicants submit that independent claims 41, 53, 71, and 90 are patentable over Lin, and the rejection must be withdrawn.

Claims 41, 42, 48, 53, 58, 63, 71, 76, and 81 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,664,024 to Nguyen et al. (hereinafter "Nguyen"). Claims 43, 54-57, 59, 68-70, 72-75, 77, 86-88, and 90 were rejected under 35 U.S.C. § 103(a) as being obvious over Nguyen. Applicants submit that independent claims 41, 53, 71, and 90 are neither anticipated by, nor obvious over, Nguyen for at least the following reasons.

First, there is no teaching or suggestion in Nguyen of a composition comprising "an acid and a constituent dissolved or dispersed in a solvent system," as recited in independent claims 41, 53, 71, and 90. Rather, Nguyen discloses a resin composition comprising photocurable monomers, oligomers, dendrimers and polymers, radical or acid photoinitiators, color generating compounds, and optionally, non-settling functionalized reactive silsesquioxanes (POSS). Col. 2, lines 47-51. The acid photoinitiators of Nguyen are essentially the same as the photosensitive acid generators disclosed in Lin, discussed above. Col. 3, lines 24-30, 41-48. They generate acid upon exposure to radiation causing the composition to cure. Nguyen fails to teach or suggest adding an acid to the composition for the same reasons explained above with regard to Lin.

Moreover, in addition to failing to disclose acid in the composition, Nguyen also fails to disclose a solvent system. In fact, a word search of the patent revealed that the word "solvent" is mentioned nowhere in the patent, and nothing in Nguyen would suggest to a person skilled in the art that a solvent system is used. That is, in the table in column 6, which lists the composition ingredients, the total percentages by weight of the individual composition ingredients (based upon total weight of the mixture) add up to 100%, indicating that no additional ingredients (such as solvents) are in the composition. Rather, all of the ingredients are dissolved in the liquid

photocurable monomers, oligomers, dendrimers and polymers in the compositions. Col. 2, lines 57-58; col. 4, lines 51-54; col. 6, lines 3-4. Thus, not only does Nguyen fail to teach or suggest acid in the composition, but the patent also fails to teach or suggest a constituent dissolved or dispersed *in a solvent system*, as recited in the claims. Accordingly, independent claims 41, 53, 71, and 90 cannot be anticipated by Nguyen and the rejection must be withdrawn.

These claims are also not obvious in view of Nguyen, because a person skilled in the art of stereolithography would have no apparent reason to modify Nguyen to include acid or a solvent system in the composition. That is, like Lin, Nguyen purposefully excludes acid from the composition, as Nguyen relies on the mechanism of the acid photoinitiator to generate acid upon exposure to photoradiation (laser) and thereby polymerize the resin composition to build each layer of the desired 3-dimensional object during the stereolithography process. See col. 3, lines 53-57; col. 4, lines 66-67. If an acid were included in the composition, it simply would not work because the composition would not cure when contacted with the laser.

Moreover, including a solvent system in the resin composition of Nguyen is fundamentally incompatible with the stereolithography process and results in a "seemingly inoperable device." *In re Gurley*, 27 F3d at 553, citing *In re Sponnoble*, 405 F.2d at 587. That is, in stereolithography a laser beam traces a part cross-section pattern on the surface of a liquid resin bath. Exposure to the UV laser light immediately cures the pattern traced on the resin. Next the machine's elevator platform descends by a single layer thickness into the resin (typically 0.05 mm to 0.15 mm). Then, a resin-filled blade sweeps across the polymerized cross-section, re-coating it with fresh liquid resin. On this new liquid surface the subsequent layer pattern is traced, adhering to the previous layer.

Eventually, the entire platform is raised out of the resin to yield a complete, solid 3-dimensional object. There is simply no opportunity during the stereolithography process to drive off solvents to recover solids, and nothing to suggest a reasonable expectation of success in creating a solid 3-D part if a solvent system was included in the resin composition. Thus, modifying the composition of Nguyen to include acid and a solvent system for use as a middle layer, as claimed, would render the composition of Nguyen unsuitable for its intended purpose in stereolithography. Accordingly, there can be no motivation to make this modification, and the rejection of claims 41, 53, 71, and 90 based upon Nguyen must be withdrawn.

Second, there is no teaching or suggestion in Nguyen of a composition that is "non-photoimagcable," as recited in independent claims 41, 53, 71, and 90. Rather, Nguyen is specifically directed towards photocurable compositions for stereolithography, and a person skilled in the art would have no "apparent reason" to modify the composition of Nguyen to make it non-photoimageable, as claimed. That is, Nguyen consistently refers to the composition as being photocurable, which is a critical property of resin compositions used in stereolithography. Otherwise, the resin would not cure when exposed to the laser light and the pattern could not be formed for that cross-sectional layer. Thus, altering the composition of Nguyen to be non-photoimageable would render the composition unsuitable for its intended purpose. Accordingly, independent claims 41, 53, 71, and 90 are patentable over Nguyen and the rejection must be withdrawn.

In addition, while the dependent claims recite additional patentable features, these claims should also be in condition for allowance, as depending from patentable independent claims. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Applicants note that all of the claims, prior to the above-described amendments, have been pending since August 14, 2006, through two office actions (dated 10/12/2006 and 5/18/2007), with new art being cited for the very first time in this third office action, dated October 24, 2007. Moreover, this new art was cited after Applicants had successfully antedated a prior art reference, which itself was cited as new art, after all prior art issues appeared to have been overcome by a previous response. Applicants further note that each time Applicants have addressed and overcome the cited prior art, an updated search has been performed and at least one new prior art reference has been cited that was discoverable at the time of an earlier-performed search. This has occurred even when claims have only been amended to include limitations that should have already been searched (such as limitations presented in formerly dependent claims). Applicants submit that the failure to perform the most thorough search, as early as possible in prosecution, as required by M.P.E.P. § 904 et seq., has created a substantial burden on Applicants and has not facilitated a "speedy and just determination of the issues ... involved in [the] application." M.P.E.P. § 904.03.

In view of the foregoing, it is believed that no further issues exist with respect to this application. Thus, Applicants respectfully request a Notice of Allowance. Any additional fees due in conjunction with this amendment should be applied against our Deposit Account No. 19-0522.

Respectfully submitted,

By 

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